## **Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application.

- 1. (canceled)
- 2. (currently amended) The method of canceling communication system noise interference according to claim [1]  $\underline{4}$  wherein steps b-d are repeated for each subchannel n used to transmit the T blocks of data.
- 3. (canceled)
- 4. (currently amended) <u>A method of canceling communication system noise interference, the method comprising the steps of:</u>
- (a) receiving T blocks of data, Y(:, t), t=1, ..., T, comprising T blocks of data, X(:,t), t=1, ..., T, transmitted over predetermined subchannels;
- (b) determining a set of subchannels, k(n), for the multichannel frequency domain equalizer (FEQ) for subchannel n;
- (c) generating multichannel FEQ coefficients, g(n), for the  $n^{th}$  subchannel used to transmit the data; and
- (d) performing multichannel (FEQ) for subchannel n using the generated multichannel FEQ coefficients;

wherein the step of determining a set of subchannels, k(n), for a subchannel n used to transmit the T blocks of data includes selecting subchannel n;

[The method of canceling communication system noise interference according to claim 3] wherein the step of determining a set of subchannels,  $\mathbf{k}(n)$ , for a subchannel n used to transmit the T blocks of data further includes selecting neighboring subchannels to subchannel n.

- 5. (currently amended) A method of canceling communication system noise interference, the method comprising the steps of:
- (a) receiving T blocks of data, Y(:, t), t=1, ..., T, comprising T blocks of data, X(:,t), t=1, ..., T, transmitted over predetermined subchannels;
- (b) determining a set of subchannels, k(n), for the multichannel frequency domain equalizer (FEQ) for subchannel n;
- (c) generating multichannel FEQ coefficients, **g**(n), for the *n*<sup>th</sup> subchannel used to transmit the data; and
- (d) performing multichannel (FEQ) for subchannel n using the generated multichannel FEQ coefficients;

wherein the step of determining a set of subchannels, k(n), for a subchannel n used to transmit the T blocks of data includes selecting subchannel n;

[The method of canceling communication system noise interference according to claim 3] wherein the step of determining a set of subchannels,  $\mathbf{k}(n)$ , for a subchannel n used to transmit the T blocks of data further includes selecting subchannels where radio frequency interference is located.

- 6. (currently amended) <u>A method of canceling communication system noise interference, the method comprising the steps of:</u>
- (a) receiving T blocks of data, Y(:, t), t=1, ..., T, comprising T blocks of data, X(:,t), t=1, ..., T, transmitted over predetermined subchannels;
- (b) determining a set of subchannels, **k**(n), for the multichannel frequency domain equalizer (FEQ) for subchannel n;
- (c) generating multichannel FEQ coefficients, g(n), for the  $n^{th}$  subchannel used to transmit the data; and
- (d) performing multichannel (FEQ) for subchannel n using the generated multichannel FEQ coefficients;

Appl. No. 09/707,874 Amdt. Dated November 34, 2004 Reply to Office Action dated January 16, 2004

wherein the step of determining a set of subchannels, k(n), for a subchannel n used to transmit the T blocks of data includes selecting subchannel n;

[The method of canceling communication system noise interference according to claim 3] wherein the step of determining a set of subchannels,  $\mathbf{k}(n)$ , for a subchannel n used to transmit the T blocks of data further includes selecting subchannels having predetermined noise characteristics.

- 7. (currently amended) <u>A method of canceling communication system noise interference, the method comprising the steps of:</u>
- (a) receiving T blocks of data, Y(:, t), t=1, ..., T, comprising T blocks of data, X(:,t), t=1, ..., T, transmitted over predetermined subchannels;
- (b) determining a set of subchannels, **k**(n), for the multichannel frequency domain equalizer (FEQ) for subchannel n;
- (c) generating multichannel FEQ coefficients, g(n), for the  $n^{th}$  subchannel used to transmit the data; and
- (d) performing multichannel (FEQ) for subchannel n using the generated multichannel FEQ coefficients;

[The method of canceling communication system noise interference according to claim 1] wherein the step of generating multichannel FEQ coefficients,  $\mathbf{g}(n)$ , for subchannel n, comprises solving the equation  $\mathbf{g}(n) = \mathbf{Y}(n)^{-1}\mathbf{s}(n)$ , where  $\mathbf{Y}(n)^{-1}$  is the pseudoinverse of a matrix of received data for subchannels  $\mathbf{k}(n)$ , and  $\mathbf{x}(n)$  is a vector of transmitted data for subchannel n.

- 8. (canceled)
- 9. (canceled)
- 10. (canceled)

Appl. No. 09/707,874 Amdt. Dated November 34, 2004 Reply to Office Action dated January 16, 2004

- 11. (canceled)
- 12. (canceled)
- 13. (canceled)
- 14. (currently amended) <u>A system for canceling communication system noise interference, the system comprising:</u>

a multichannel frequency domain equalizer configured to receive T blocks of data, Y(:,t), t=1, ..., T, comprising T blocks of data, X(:,t), t=1, ..., T, transmitted over predetermined subchannels, wherein the multichannel frequency domain equalizer is operational generate multichannel frequency domain equalization (FEQ) coefficients, g(n), associated with the  $n^{th}$  subchannel used to transmit the data, and to perform multichannel FEQ for the  $n^{th}$  subchannel using the generated multichannel FEQ coefficients, and further wherein the FEQ coefficients are associated with a set of subchannels, k(n), for the  $n^{th}$  subchannel used to transmit the T blocks of data, [The system according to claim 13] wherein the FEQ is operational to increase a subchannel signal-to-noise ratio beyond that achievable using a single channel FEQ.

15. (currently amended) A system for canceling communication system noise interference, the system comprising:

<u>a multichannel frequency domain equalizer configured to receive T blocks of data,</u> Y(:, t), t=1, ..., T, comprising T blocks of data, X(:,t), t=1, ..., T, transmitted over predetermined subchannels, wherein the multichannel frequency domain equalizer is operational generate multichannel frequency domain equalization (FEQ) coefficients, g(n), associated with the  $n^{th}$  subchannel used to transmit the data, and to perform multichannel FEQ for the  $n^{th}$  subchannel using the generated multichannel FEQ coefficients, and further wherein the FEQ coefficients are associated with a set of subchannels, k(n), for the  $n^{th}$  subchannel used to transmit the T blocks of data, [The system according to claim 13] wherein the FEQ is operational to cancel

Appl. No. 09/707,874 Amdt. Dated November 34, 2004 Reply to Office Action dated January 16, 2004

correlated subchannel noise caused by deterministic noise spreading associated with a plurality of subchannels.

16. (currently amended) A system for canceling communication system noise interference, the system comprising:

a multichannel frequency domain equalizer configured to receive T blocks of data, Y(:,t), t=1, ..., T, comprising T blocks of data, X(:,t), t=1, ..., T, transmitted over predetermined subchannels, wherein the multichannel frequency domain equalizer is operational generate multichannel frequency domain equalization (FEQ) coefficients, g(n), associated with the  $n^{th}$  subchannel used to transmit the data, and to perform multichannel FEQ for the  $n^{th}$  subchannel using the generated multichannel FEQ coefficients, and further wherein the FEQ coefficients are associated with a set of subchannels, k(n), for the  $n^{th}$  subchannel used to transmit the T blocks of data, [The system according to claim 13] wherein the FEQ is operational to increase achievable digital subscriber network data rate beyond that achievable using a single channel FEQ.